



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: October 1, 1990

In reply refer to: P-90-28

Honorable Samuel T. Skinner
Secretary
U.S. Department of Transportation
400 Seventh Street, N.W.
Washington, DC 20590

On October 3, 1989, the United States fishing vessel NORTHUMBERLAND struck and ruptured a 16-inch-diameter natural gas transmission pipeline about 1/2 nautical mile offshore in the Gulf of Mexico, and about 5 1/3 nautical miles west of the jetties at the entrance to Sabine Pass, Texas. Natural gas under a pressure of 835 psig was released. An undetermined source on board the vessel ignited the gas, and within seconds, the entire vessel was engulfed in flames. The fire on the vessel burned itself out on October 4. Leaking gas from the pipeline also continued to burn until October 4. Of the 14 crewmembers, 11 died as a result of the accident.¹

When the accident occurred, the NORTHUMBERLAND was in shallow waters and close to shore, which was normal and usual for its trade. The major constraint to the vessel's operation in the area was its draft. The water depth and the estimated draft of the vessel at the time of the accident were both about 10 feet. Consequently, the bottom of the vessel was close to the sea bottom or slightly penetrating the bottom when it struck the pipeline.

The pipeline was not fully buried when it was struck by the NORTHUMBERLAND. Diving surveys conducted after the accident established that the unburied segments of the pipeline were not confined to a limited length, but extended for as much as 400 feet in the immediate accident area. The quantity and type of marine growth found on the pipeline indicated that the pipeline had been unburied for a prolonged period. Damage to the concrete coating also indicated that the pipeline had been previously struck by other vessels or equipment towed by vessels.

¹ Additional information is given in the accident report. (National Transportation Safety Board, 1990. Fire on board the F/V NORTHUMBERLAND and rupture of a natural gas transmission pipeline in the Gulf of Mexico near Sabine Pass, Texas, October 3, 1989. Pipeline Accident Report NTSB/PAR-90/02. Washington, DC.)

The master had sufficient experience as the master of a vessel operating in the offshore waters of Texas and Louisiana to have been very familiar with these waters. Statements made by the master during the postaccident investigation indicated that he had no specific knowledge of the presence and location of submerged pipelines in these waters. Although he was aware that submerged pipelines existed in the Gulf of Mexico, he believed that all submerged pipelines were buried beneath the seabed and were required to be maintained in that condition. Officials of the owner and operator of the vessel also believed that submerged pipelines were buried and maintained in that condition. As a result, the company did not train its vessel masters about potential dangers of submerged pipelines and did not have any policies regarding the operation of its vessels near submerged pipelines. Based on his training and experience, the master consequently had no reason to be concerned about submerged pipelines.

Further, the Safety Board has been concerned that the perception held by the company may not be an isolated situation. Statements by officials from another commercial fishing company and from an association for the shrimping industry indicate that the same perception may be held by most of the commercial fishing industry in the Gulf of Mexico.

To address the lack of knowledge about submerged pipelines within the fishing industry, the Safety Board recommended on February 22, 1990, that the Department of Transportation (DOT):

P-90-3

Issue an advisory notice or use other means to caution commercial fishing, shrimping, and other marine vessel operators in the Gulf of Mexico that submerged offshore pipelines may be unprotected on the ocean floor and that marine vessels can damage such pipelines and endanger their crews when operating in water depths comparable to a vessel's draft or when operating bottom dragging equipment.

In a response dated May 30, 1990, the DOT provided copies of warnings issued by the Office of Pipeline Safety (OPS) within the Research and Special Programs Administration (RSPA) and by the U.S. Coast Guard. The OPS issued an "Alert Notice," dated April 9, 1990, to all natural gas and hazardous liquid pipeline operators and to commercial fishing and shrimping associations. The notice urged pipeline operators to identify commercial fishing and vessel operators and to caution them that submerged pipelines may be unprotected. The notice also recommended that operators identify and correct any conditions that would violate requirements of the OPS and of the Minerals Management Service (MMS) within the Department of the Interior (DOI), or that would violate the terms and conditions of a U.S. Army Corps of Engineers (the Corps) permit, especially those requirements or conditions regarding the burial of any pipeline in shallow water. The Coast Guard issued a Local Notice to Mariners in May 1990 for the Gulf of Mexico region that warned mariners about the hazards of submerged pipelines. The advisory notices issued by the OPS and the Coast Guard were satisfactory responses to the recommendation, which has been classified as "Closed--Acceptable Action."

An offshore pipeline can be and often is subject to the jurisdiction of several Federal and State regulatory agencies. To illustrate, the pipeline involved in this accident was subject to the jurisdiction of the OPS, the MMS, the Corps, and the General Land Office of Texas. The investigation of the NORTHUMBERLAND accident revealed many deficiencies in the regulations for submerged pipelines and the oversight and enforcement programs.

The regulations or standards of the OPS, the MMS, and the Corps differ in their applicability and scope. Pipelines are exempted from regulation by one agency but not another because of seemingly arbitrary factors such as minimum stress level, diameter, or location of a pipeline. For example, the OPS does not regulate hazardous liquid pipelines that operate at a stress level of 20 percent or less, while the MMS and the Corps do not have a similar exclusion. The MMS requires the burial of pipelines greater than 8 5/8 inches in diameter, whereas the OPS requires the burial of hazardous liquid and natural gas transmission pipelines without consideration of diameter.

Further, DOT regulations also have grandfathering provisions that exempt existing pipelines from many standards. As a result of the inconsistent standards, exemptions, and grandfathering provisions among the different regulatory agencies, submerged pipelines may not be required to be buried, protected, or even regulated.

The Safety Board is also concerned about the possible number of submerged pipelines that have never been regulated, were never required to be buried and protected, and have never been regularly inspected. Although the number of reported incidents of submerged pipelines damaged by surface vessels is small according to OPS (21 incidents since 1985), the large number of claims filed under Louisiana's Fisherman's Gear Compensation Fund (about 364 a year) suggests that the danger from underwater obstructions, including pipelines, is greater than OPS records suggest. Because all submerged pipelines are not subject to OPS or other reporting requirements, and because the number, location, and owners of all submerged pipelines in the Gulf of Mexico are not known, the actual danger cannot be ascertained from OPS incident reports alone. Consequently, the magnitude of the problem and the potential danger of submerged pipelines to surface vessels are unknown.

Therefore, in a safety recommendation issued on February 22, 1990, the Safety Board recommended that the DOT:

P-90-4

Identify, with the assistance of the Department of the Interior and other Gulf Coast States that may have jurisdiction, the type, number, location, and owner of all offshore pipelines in the Gulf of Mexico.

A similar recommendation, P-90-1, was issued on the same date to the DOI. In a response dated May 30, 1990, the DOT cited a recently completed study conducted as part of MMS' ongoing environmental studies program. The study includes the information specified in the recommendation for those pipelines

previously documented by the MMS. The DOT also cited the records maintained under the Corps' permit program. The DOT further stated it is considering proposals to require pipeline operators to maintain current maps and other information about their pipelines that can be used to identify and locate pipeline facilities. The DOI responded that it was cooperating with the DOT through a DOT-sponsored task force that was organized as a result of the NORTHUMBERLAND accident. (The task force is discussed later in this letter.)

The responses of the DOI and the DOT, however, did not completely meet the intent of the recommendations. The study and records cited in the DOT's response identify known pipelines that were issued right-of-way permits. The Safety Board's primary concern, however, is for those pipelines that were--for whatever reason--never issued right-of-way permits or otherwise regulated. Until their number, location, and ownership are established, the potential danger to surface vessels remains unknown. The Safety Board urges both DOI and DOT to renew their efforts to collect these data, and to utilize the resources of the States in the gulf region. However, because of the positive efforts of the DOT and DOI, Safety Recommendations P-90-1 to the DOI and -4 to the DOT are classified as "Open--Acceptable Response."

Because of concerns about deficiencies in the regulations and practices to protect and inspect submerged pipelines that became apparent during the investigation, the Safety Board, on February 22, 1990, recommended that the DOT:

P-90-5

Determine, with the assistance of the Department of the Interior, effective methods of inspection, maintenance, and protection for offshore pipelines located in the Gulf of Mexico to depths of water comparable to the maximum drafts of marine vessels that may operate outside of established sea lanes.

A similar recommendation, P-90-2 was issued on the same date to the DOI. In response to the recommendation, the DOT stated that a Federal task force, under the sponsorship of OPS, had been established in February 1990 to develop solutions to the hazards that may exist between offshore pipelines and fishing vessels in the Gulf of Mexico. Other participating agencies included the MMS, the Coast Guard, the Corps, the National Oceanic and Atmospheric Administration, and the States of Texas and Louisiana. The OPS has indicated that by October 1, 1990, the task force will have completed a report on the long-term regulatory and administrative projects to be initiated by each agency. The DOI responded that it is cooperating with the DOT through the Federal task force.

Since these two recommendations were issued, the Safety Board has become concerned that the safety problems with submerged pipelines are not confined to the offshore areas of the Gulf of Mexico. A submerged pipeline under a river, shipping channel, or other body of water is also susceptible to being unburied and damaged or ruptured by a vessel. For example, on January 2, 1990, a submerged 12-inch pipeline transporting heating oil was ruptured in the Arthur Kill channel between Staten Island, New York, and Linden, New

Jersey. Evidence indicates that the pipeline was struck possibly by a passing ship or dredge.

Although the Federal task force is addressing safety issues involving commercial fishing vessels and offshore pipelines in the Gulf of Mexico, the Safety Board now believes that the scope of the initial recommendations needs to be expanded to evaluate the level of safety that exists for all submerged pipelines located under navigable waterways. The evaluation should address the issues and problems concerning the practices of the both the fishing and pipeline industries, the jurisdiction over submerged pipelines, the deficiencies in regulatory standards for submerged pipelines, the inadequacy of enforcement and oversight, and the need for improved communication and coordination. Because the RSPA, through the OPS, is the primary Federal agency for pipeline safety, the Safety Board believes that RSPA, with the assistance of the MMS, the Coast Guard, and the Corps, should build on the work of the current Federal task force and develop and implement effective methods and requirements to bury, protect, inspect the burial depth of, and maintain all submerged pipelines in areas subject to damage by surface vessels and their operations. The Safety Board has therefore classified Safety Recommendations P-90-5 to the DOT and -1 to the DOI as "Closed--Superseded" by Recommendations P-90-29 to the RSPA and -34 to the MMS. The Safety Board has also issued similar recommendations to the other Federal agencies on the DOT-sponsored task force.

The Safety Board recognizes that insufficient resources have adversely affected Federal and State enforcement programs. The staffing of the OPS Southwest regional office is not sufficient to meet its enforcement and oversight responsibilities given the number of offshore pipeline operators, the miles of offshore pipelines, and the office's additional responsibilities for land-based pipelines and the evaluation of DOT-certified State inspection programs. The inability of the regional office to comply with its internal policies of inspection intervals also suggests that staffing levels are insufficient. Because of the shortage of qualified inspectors, the Southwest regional office does not adequately fulfill its enforcement and oversight responsibilities.

The Safety Board has recognized in previous accident investigations the shortage of OPS personnel and its effect on programs intended to carry out OPS responsibilities.² As a result of those investigations, the Safety Board issued Safety Recommendations P-87-28 to the DOT, and P-88-13 and P-90-13 to the RSPA:

² (a) National Transportation Safety Board. 1987. William Pipe Line Company, Liquid pipeline rupture and fire, Mounds View, Minnesota, July 8, 1986. Pipeline Accident Report NTSB/PAR-87/02. Washington, D.C. 58 p. (b) National Transportation Safety Board. 1988. Piedmont Natural Gas Company, natural gas explosion and fire, Winston-Salem, North Carolina, January 18, 1988. Pipeline Accident Report NTSB/PAR-88/01. Washington, D.C. 43 p. (c) National Transportation Safety Board. 1990. Kansas Power and Light Company, natural gas pipeline accidents, September 16, 1988 to March 29, 1989. Pipeline Accident Report NTSB/PAR-90/01. Washington, D.C. 53 p.

P-87-28

Increase, through use of State inspection personnel and by increasing the number of Office of Pipeline Safety (OPS) inspectors, the OPS pipeline inspectors, the OPS pipeline inspection capabilities sufficient to perform thorough, periodic safety reviews of all pipeline operations directly subject to OPS monitoring and to perform timely, effective, followup compliance reviews of those operations in which compliance deficiencies are identified.

P-88-13

Monitor the staffing levels of the certified State pipeline inspection agencies, and require staffing level increases sufficient to respond to responsibilities beyond programmed inspection activities.

P-90-13

Assess the adequacy of and modify, as necessary, its program for monitoring and detecting inadequacies in State pipeline safety programs accepted by RSPA for determining compliance with Federal pipeline safety standards.

The RSPA Administrator has also recognized the OPS staffing problem and in August 1990 commented that the "...resource deficiency, when matched against the issues we face is of particular concern."³ The Administrator pointed out that the OPS has overall responsibility for more than 2,000 pipeline operators of 1.6 million miles of gas pipelines and more than 200 operators of 155,000 miles of hazardous liquid pipelines. He further commented that to improve operations, the pipeline safety program:

- (1) is being placed on a risk-assessment basis to target inspections and to rank regulatory projects so that optimum utilization will be made of the program's limited resources;
- (2) is being upgraded to meet the challenges of an aging pipeline infrastructure;
- (3) is being examined to determine if additional rulemaking actions are needed to enhance public safety;
- (4) is being improved by enhancing cooperation among Federal agencies to more effectively meet the OPS responsibilities for pipeline safety;

³ Dungan, Travis P. 1990. Current thinking and future activities at DOT and OPS. Pipe Line Industry. 73(2): 21-24.

- (5) is seeking to expand its staff from 51 to 60 personnel to increase its capabilities to determine compliance, carry out enforcement, and develop regulations (3 of the new personnel are to be added to the OPS Southwest regional office to meet the agency's goal of more frequent inspections of offshore pipelines, especially those of operators with a history of violations, poor accident record, or poor rating under the OPS computer-based risk assessment tool); and
- (6) is seeking to improve the current partnership between Federal and State agencies by increasing the amount of funds provided to the States.

The Safety Board commends these proposed actions, which, if implemented could greatly enhance pipeline safety. However, the Safety Board recognizes that Federal and State agencies with responsibilities for pipeline safety have limited resources, and the likelihood of these agencies obtaining additional resources may be small unless RSPA's proposed actions are endorsed by the Secretary of the Department of Transportation as a priority need within the Department. The Safety Board believes that the Secretary should provide staffing and other resources adequate for the OPS to effectively fulfill its regulatory, inspection, enforcement, and State program oversight responsibilities.

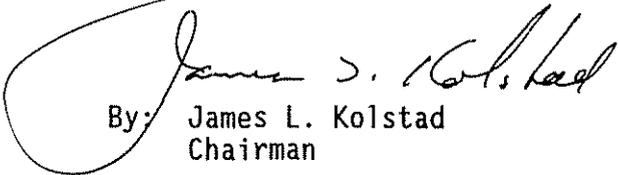
The Safety Board also believes that the inadequacy of OPS resources is the primary reason for the problems previously identified in RSPA's oversight of State pipeline safety programs, in its lack of frequent and thorough inspections of pipeline operators for which OPS has sole responsibility, and in its previous reluctance to implement resource-consuming enforcement actions. Although accomplishment of the objectives of Safety Recommendations P-87-28, P-88-13, and P-90-13 is needed, the Safety Board does not believe it is reasonable to expect OPS to accomplish those objectives without adequate resources to fulfill its responsibilities. Consequently, the Safety Board has reclassified Safety Recommendations P-87-28, P-88-13, and P-90-13 as "Closed--Superseded" by Safety Recommendation P-90-28.

Therefore, as a result of this accident, the National Transportation Safety Board recommends that the Department of Transportation:

Provide adequate staffing and other resources to the Office of Pipeline Safety so that it can effectively fulfill its regulatory, inspection, enforcement, and State program oversight responsibilities. (Class II, Priority Action) (P-90-28)

Also as a result of its investigation, the Safety Board issued recommendations to the Zapata Haynie Corporation, Natural Gas Pipeline Company of America, Research and Special Programs Administration, U.S. Coast Guard, U.S. Department of the Interior, Minerals Management Service, U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, Interstate Natural Gas Association of America, American Gas Association, American Public Gas Association, American Petroleum Institute, National Fish Meal and Oil Association, Louisiana Shrimp Association, and National Council of Fishing Vessel Safety and Insurance.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, LAUBER, BURNETT, and HART, Members, concurred in this recommendation.


By: James L. Kolstad
Chairman